

Letter to the editor: Atypical weather is associated with the 2022 early start of West Nile virus transmission in Italy

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To the editor: In the recent study by Barzon et al. [1], the authors report an unusually early onset of West Nile virus (WNV) transmission in Italy in 2022. The virus was detected in mosquitoes on 8 June and in humans on 18 June, about one month earlier than usually detected. In addition to describing the epidemiological and genetic characteristics of cases, Barzon et al. suggest that the early WNV season may be due to changes in weather conditions, mentioning that March–May 2022 has been an unusually dry and hot period in northern Italy.

Transmission suitability indices are commonly used to investigate the relationships between weather and mosquito-borne disease. We have specifically developed [2] and regularly apply such a transmission suitability measure to investigate the spread of WNV spread, e.g. in Portugal, Israel and Brazil [3-5]. As we regularly estimate WNV transmission suitability across Europe, we have recently noted that our early estimates for Italy during 2022 align with the important observations made by Barzon et al. in their paper.

In Italy, there is typically a steady increase in estimated WNV transmission suitability between April and July. Accordingly, the first reported cases appear during mid-July or later. In line with the hypothesis by Barzon et al., we noticed that May and June 2022 exhibited unusually high estimated transmission suitability (<https://doi.org/10.6084/m9.figshare.20489151.v1>). These estimates were second only to 2018 – the year in which the largest WNV outbreak of the last decade occurred in Italy. Underlying the observed increases in suitability in 2022 was a country-wide average increase in temperature of ca 2 and 2.7°C in May and June, respectively, compared with the mean of the past 10 years. In

parallel, there was a tendency for dryer weather, with average decreases of 3.9 and 6.5% in relative humidity in May and June 2022, respectively. This supports the association between the atypical weather conditions and the early WNV transmission season in Italy during 2022, as was hypothesised by Barzon et al.

Variation in local weather is long known to be a major factor affecting the dynamics and spread of mosquito-borne diseases. Suitability measures informed by climate data cannot only retrospectively estimate the transmission potential of a virus, but can also provide real-time insights on the start and potential magnitude of current transmission seasons. Such insights are becoming increasingly important, not only to inform policymakers but to help mitigate future outbreaks in the context of ongoing climate change trends. As Europe experiences an ever-increasing reporting rate of local transmission events of mosquito-borne viruses, additional resources should be invested in transmission suitability estimation methodologies, in parallel with enhancing surveillance infrastructure and research of these pathogens.

Authors' contributions

JL and UO conceived and wrote the initial draft. All authors read and critically revised the letter.

Conflict of interest

None declared.

References

1. Barzon L, Montarsi F, Quaranta E, Monne I, Pacenti M, Michelutti A, et al. Early start of seasonal transmission and co-circulation of West Nile virus lineage 2 and a newly introduced lineage 1 strain, northern Italy, June 2022. *Euro Surveill.* 2022;27(29):2200548. <https://doi.org/10.2807/1560-7917.ES.2022.27.29.2200548> PMID: 35866436
2. Obolski U, Perez PN, Villabona-Arenas CJ, Thézé J, Faria NR, Lourenço J. MVSE: An R-package that estimates a climate-driven mosquito-borne viral suitability index. *Methods Ecol Evol.* 2019;10(8):1357-70. <https://doi.org/10.1111/2041-210X.13205> PMID: 32391139
3. Lourenço J, Thompson RN, Thézé J, Obolski U. Characterising West Nile virus epidemiology in Israel using a transmission suitability index. *Euro Surveill.* 2020;25(46):1900629. <https://doi.org/10.2807/1560-7917.ES.2020.25.46.1900629> PMID: 33213688
4. Lourenço J, Barros SC, Zé-Zé L, Daminieli DSC, Giovanetti M, Osório HC, et al. West Nile virus transmission potential in Portugal. *Commun Biol.* 2022;5(1):6. <https://doi.org/10.1038/s42003-021-02969-3> PMID: 35013546
5. Costa ÉA, Giovanetti M, Silva Catenacci L, Fonseca V, Aburjaile FF, Chalhoub FLL, et al. West Nile Virus in Brazil. *Pathogens.* 2021;10(7):896. <https://doi.org/10.3390/pathogens10070896> PMID: 34358046

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